In the Claims

Applicants have submitted a new complete claim set showing marked up claims with insertions indicated by underlining and deletions indicated by strikeouts and/or double bracketing.

Please amend pending claims 71 and 90 as noted below.

1–70. (Cancelled).

71. (Currently Amended) A system for analyzing an extended object labeled with at least two unit-specific markers comprising:

a central processing unit;

an input device for inputting a plurality of object-dependent impulses of ~~an~~ the extended object;

an output device;

a memory;

at least one bus connecting the central processing unit, the memory, the input device, and the output device;

the memory storing a calculating module configured to calculate an autocorrelation function for said plurality of object-dependent impulses of said extended object input using said input device, wherein the calculating module resolves the at least two unit-specific markers of the extended object.

72. (Original) The system of claim 71, wherein the plurality of object-dependent impulses is input as a function of time using said input device.

73. (Original) The system of claim 72, wherein the autocorrelation function is defined by the formula:

$$G(\tau) = (1/T)\int I(t)I(t+r)dt$$

where G(τ) is the autocorrelation function of the time dependence of measured object-dependent impulses, T is the total time of measurement of I(t), and I(t) is the object-dependent impulse measurement at each time point t.

74. (Original) The system of claim 72, wherein the autocorrelation function is defined by the formula:

$$G_j = (1/N)\sum_{i=0}^{N} I_i I_{i+j}$$

where G_j is the autocorrelation function of the time dependence of measured object-dependent impulses at time $j\Delta t$, $N\Delta t$ is the total time of measurement of I_i and I_i is the object-dependent impulse measurement at each time point i, and Δt is a time interval.

75. (Currently Amended) The system of claim 71, the memory further storing a storage module configured to store object-dependent impulses of ~~an~~ the extended-object.

76. (Original) The system of claim 75, the memory further storing a comparison module configured to compare object-dependent impulses of at least two extended-objects.

77. (Original) The system of any one of claims 71-76, wherein the extended object is a polymer.

78. (Original) The system of claim 77, wherein the polymer is a nucleic acid.

79. (Original) The system of claim 78, wherein the nucleic acid is DNA.

80. (Original) The system of claim 71, wherein the plurality of object-dependent impulses results from fluorescence resonance energy transfer.

81. (Original) The system of claim 71, further comprising an apparatus for stretching said extended object.

82. (Original) The system of claim 81, wherein said extended object is a polymer.

83. (Original) The system of claim 82, wherein said polymer is a nucleic acid.

84. (Original) The system of claim 83, wherein said nucleic acid is DNA.

85. (Original) The system of claim 71, further comprising a laser, optical elements, and a detector operably linked to produce and detect object-dependent impulses of said extended object.

86. (Original) The system of claim 85, wherein said detector is a photodetector.

87. (Original) The system of claim 85, wherein said extended object is a polymer.

88. (Original) The system of claim 87, wherein said polymer is a nucleic acid.

89. (Original) The system of claim 88, wherein said nucleic acid is DNA.

90. (Currently Amended) A computer program product for use in conjunction with a computer, the computer program product comprising a computer readable storage medium and a computer program mechanism embedded therein, the computer program mechanism comprising a calculating module configured to calculate an autocorrelation function of a plurality of object-dependent impulses of an extended object <u>having at least two unit-specific markers, wherein the calculating module resolves the at least two unit-specific markers on the extended object</u>.

91. (Original) The computer program product of claim 90, wherein the plurality of object-dependent impulses is input as a function of time using said input device.

92. (Original) The computer program product of claim 91, wherein the autocorrelation function is defined by the formula:

$$G(\tau) = (1/T)\int_0^T I(t)I(t+\tau)dt$$

where G(τ) is the autocorrelation function of the time dependence of measured object-dependent impulses, T is the total time of measurement of I(t), and I(t) is the object-dependent impulse measurement at each time point

93. (Original) The computer program product of claim 91, wherein the autocorrelation function is defined by the formula:

$$G_j = (1/N)\sum_{i=0}^{N} I_i I_{i+j}$$

where G_j is the autocorrelation function of the time dependence of measured object-dependent impulses at time jΔt, NΔt is the total time of measurement of I_i, and I_i is the object-dependent impulse measurement at each time point i, and Δt is a time interval.

94. (Previously Presented) The computer program product of claim 90, the memory further storing a storage module configured to store object-dependent impulses of the extended-object.

95. (Original) The computer program product of claim 90, the memory further storing a comparison module configured to compare object-dependent impulses of at least two extended-objects.

96. (Original) The computer program product of claim 90, wherein the extended object is a polymer.

97. (Original) The computer program product of claim 90, wherein the polymer is a nucleic acid.

98. (Original) The computer program product of claim 90, wherein the nucleic acid is DNA.

99. (Original) The computer program product of claim 90, wherein the plurality of object-dependent impulses results from fluorescence resonance energy transfer.

100. (Original) The computer program product of claim 90, wherein analysis of the extended object provides information about the length of the extended object.

101. (Previously Presented) The computer program product of claim 90, wherein analysis of the extended object provides information about the distance between labels on the extended object.

102. (Original) The computer program product of claim 90, wherein analysis of the extended object provides information about the velocity of the extended object.

103. (Original) The computer program product of claim 90, wherein analysis of the extended object provides information about the linear arrangement of units within the extended object.

104. (Original) The system of claim 85 further comprising an apparatus for stretching said extended object.